

Recurrent Ductal Carcinoma In Situ After Total Mastectomy

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A case report is presented of a woman with recurrent DCIS occurring several years following a total mastectomy, the diagnosis of which was aided by a subpectoral saline implant. A discussion of factors associated with recurrence and a review of the literature is provided. A role for selective use of mammography in screening postmastectomy reconstructed breasts in patients at high risk for recurrence is suggested.

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INTRODUCTION

Ductal carcinoma in situ (DCIS) was initially described by Broders in 1932 [1] and has come to define neoplastic-appearing epithelial cells of ductal origin within the breast that show no evidence of invasion. There are currently several different histologic patterns of DCIS, which are generally divided into either comedo or noncomedo subtypes. Although the natural history of these premalignant lesions is still being defined, treatment recommendations are usually similar regardless of histology. Total mastectomy has been the traditional gold standard treatment for DCIS. While many physicians consider total mastectomy to be curative for DCIS, breast-conserving procedures are becoming increasingly popular in view of their success in managing invasive malignancy. Although recurrence rates can be high for certain subpopulations of patients with DCIS treated with breast conservation, it should not be overlooked that DCIS can also recur after total mastectomy—as this case report illustrates.

CASE REPORT

A 42-year-old female initially presented in March 1991 after routine screening mammography revealed an abnormal area of microcalcification in the left breast. The patient underwent a needle localization biopsy, which on pathologic review demonstrated a 5-mm lesion of DCIS with non-necrotic cribriform and micropapillary forma-

tions and margins of less than 1 cm (Van Nuys Classification = group 1) [2]. Because of a strong family history of breast cancer, which included the patient's mother and two older sisters, she underwent bilateral total mastectomies through standard midbreast elliptical incisions in April 1991. The final pathology from the total mastectomy specimens revealed residual ductal carcinoma in situ (histologic characteristics identical to the biopsy and clear margins) but no invasive malignancy in the left breast, and only a fibroadenoma in the right breast. Approximately 10 months later, the patient underwent bilateral breast reconstruction using subpectoral saline implants and nipple/areola tattooing. She then followed-up at 6-month intervals with physical examination and screening mammography, and in November 1994, a routine screening mammogram revealed an extensive area of microcalcification in the left breast. This area was in the lower outer quadrant (Fig. 1A) and was localized utilizing skin beads (Fig. 1B).

The patient subsequently underwent an open breast biopsy (Fig. 2). Pathologic examination of the area of microcalcification demonstrated DCIS with a noncomedo papillary histology, moderate nuclear atypia, no ne-

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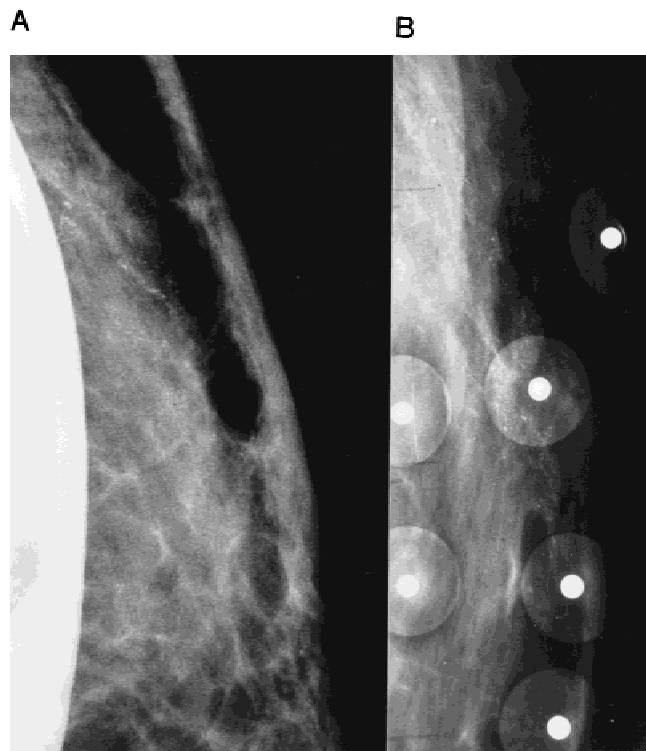


Fig. 1. Mammographic views demonstrating areas of microcalcification. (A) Screening view. (B) View after placement of skin beads for localization.

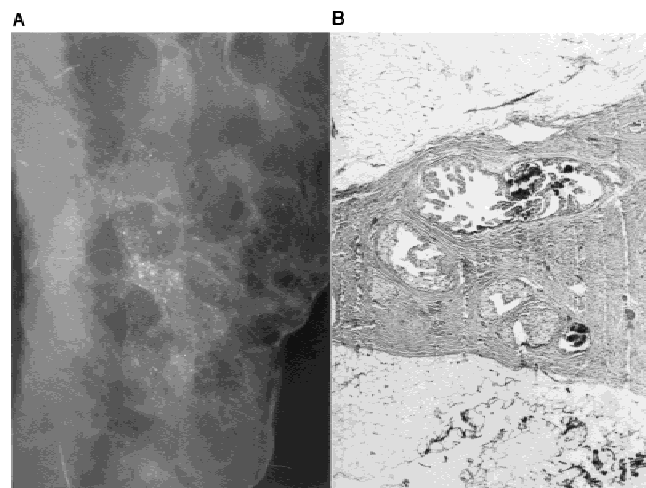


Fig. 2. Specimen evaluation. (A) Specimen mammogram showing microcalcification. (B) Microscopic picture of specimen showing DCIS and microcalcification in ductules.

crosis, and a positive margin. A repeat mammogram revealed residual microcalcification still present in the region of the breast biopsy. The patient subsequently underwent a wide reexcision, with removal of the saline implant. The reexcision specimen revealed residual DCIS (histologic characteristics identical to the biopsy) but no evidence of invasive malignancy. All surgical

margins were negative. As postoperative adjuvant therapy, the patient received 50 Gy of XRT to the left chest wall to treat any residual breast tissue still present. In November 1995, approximately 1 year after the initial diagnosis of recurrent DCIS, the patient underwent left breast reconstruction using a saline implant and latissimus dorsi rotational flap. She has no evidence of recurrent disease at the current time.

DISCUSSION

DCIS is a heterogeneous group of lesions found within the breast ducts and ductules that consist of cells which have undergone malignant transformation but have not invaded through the ductular basement membrane into the surrounding stroma. Characterization of DCIS usually focuses on the cell's growth pattern and biologic behavior, which allows separation of these breast lesions into comedo and noncomedo subtypes. The comedo form of DCIS is usually characterized by nuclear polymorphism, numerous mitoses, and significant necrosis. These histologic observations are rarely seen in the noncomedo subtypes of DCIS, which are usually classified as cribriform, papillary, micropapillary, clinging, and solid, based upon their architectural orientation. The more malignant appearance of the comedo subtype of DCIS is associated with a higher cellular proliferation rate, a higher incidence of erb B2 expression, and is more likely to be seen in conjunction with areas of microinvasion than the noncomedo subtypes.

Since the natural history of DCIS has been poorly understood, treatment has traditionally been the same regardless of histologic subtype. Total mastectomy has been the predominant form of treatment for DCIS up until the last 10 years, when promising results utilizing breast conservation for invasive cancer led to the more frequent application of this technique to DCIS. A review of several large series (Table I) [3–12] demonstrates that even though total mastectomy is considered definitive therapy for DCIS, there is still a 0–8% incidence of local recurrence. Admittedly, many of these series include patients from the 1960s and 1970s, prior to the routine use of screening mammography, and thus many of the initial lesions were palpable at the time of presentation and may have contained areas of undetected microinvasion.

With the use of widespread screening mammography, the spectrum of DCIS that is being diagnosed is changing. Currently, DCIS is most commonly detected as a nonpalpable mammographic abnormality. When identified in this fashion, many authors feel that the treatment of DCIS with total mastectomy should be associated with cure rates approaching 100% [11]. However, even in this setting, as this case report illustrates, recurrence of DCIS after total mastectomy is still possible and surgeons advising patients of their various treatment options need to remember to be certain that their patients understand this

TABLE 1. Recurrence After Mastectomy of Ductal Carcinoma In Situ

| Authors | No. of patients | No. of recurrences (%) | Follow-up |
|-----------------------------|-----------------|------------------------|-------------------------|
| Bedwani et al. [3] | 112 | 1 (1) | 5 years |
| Brown et al. [4] | 40 | 0 (0) | 1–15 years |
| Carter and Smith [5] | 38 | 3 (8) | 15 years (mean 3 years) |
| Lagios et al. [6] | 53 | 3 (6) | 10 years |
| Millis and Thynne [7] | 20 | 0 (0) | 10 years |
| Silverstein et al. [8] | 228 | 2 (1) | mean 78 months |
| Sunshine et al. [9] | 70 | 3 (4) | 10 years |
| Von Reuden and Wilson [10] | 47 | 1 (2) | none specified |
| Westbrook and Gallager [11] | 60 | 2 (3) | 20 years |
| Schuh et al. [12] | 51 | 1 (2) | mean 5.5 years |

small but real possibility, for medical as well as legal reasons.

The mechanism by which DCIS recurs after total mastectomy is probably a function of not only the amount of breast tissue left behind but also a function of how likely the remaining breast tissue is to undergo cellular transformation. The anatomic boundaries of the breast can extend from immediately under the skin dermis to the pectoral fascia and well into level 1 of the axilla, and in some cases can include tissue in the interstices of the pectoral muscle or ectopic tissue in the mammary milk line. The exact amount of breast tissue left after total mastectomy is related to the technique utilized for mastectomy in terms of how thin the skin flaps are made, whether the pectoralis fascia is removed, and how extensively the tail of the breast is dissected from the axilla. Estimates made on cadaveric studies suggest that as much as 10–15% of the breast tissue might remain after subcutaneous mastectomy made through an inframammary incision, and 1–5% of the breast tissue might remain after a more traditional total mastectomy that included removal of the nipple with an elliptical incision [13,14]. There is currently no uniform method for determining the risk of recurrence after total mastectomy for DCIS. Factors such as age, extent of DCIS, positive vs. negative margins, nuclear grade, ploidy, mitotic index, and proliferation index may be helpful but are currently unproven. In the largest review to date of patients with DCIS, Silverstein [2] has found that the Van Nuys Index (a combination of nuclear grade and comedonecrosis assessment), margin width, and tumor size are significant independent risk factors for local recurrence and invasive local recurrences for patients with DCIS treated with breast preservation. Molecular markers such as erb B2, BRCA 1, and BRCA 2 are currently being examined at this institution to see if their presence may denote a higher risk of recurrence, and hopefully identify a subpopulation of patients who might benefit from a more aggressive screening policy after mastectomy.

There are currently no unified mammographic screening recommendations for patients who have undergone mastectomy with or without immediate reconstruction,

and the area remains quite controversial. While breast implants utilized for breast augmentation are generally considered to hinder the ability of mammography to screen breasts and detect nonpalpable breast lesions [15], to our knowledge this is the first case report of a breast implant aiding in the diagnosis of recurrent nonpalpable DCIS after total mastectomy by allowing the residual breast tissue to be far enough away from the chest wall to be imaged. Most authors have felt that mammography of reconstructed breasts is generally not necessary, as the roughly 10% of patients who do develop recurrent disease after reconstruction do so in the skin and subcutaneous tissue overlying the flap: places easily amenable to physical examination [16]. However, another recent case report did demonstrate the ability of mammography to detect recurrent nonpalpable carcinoma that developed in a breast reconstructed with a transverse rectus abdominus myocutaneous flap [17].

Whether earlier detection of recurrent invasive cancer in the reconstructed breast will have any impact on survival remains to be determined. Up to 50% of recurrences following treatment of DCIS are invasive [2]; however, since recurrence is generally an uncommon occurrence (< 5%), widespread screening mammography for the entire population of these patients is probably of low yield and not cost-effective. For patients who undergo total mastectomy for DCIS, the earlier the recurrent disease is detected, the higher the likelihood that some curative intervention involving surgery, radiation, and/or tamoxifen can still be undertaken. As we await the outcome of studies to correlate various markers of breast cancer with recurrence, we advocate the selective use of mammography in screening the postmastectomy reconstructed breast focusing on patients who have a strong family history of breast cancer or who for technical reasons are felt to have more than 5% of their breast tissue still present after mastectomy.

REFERENCES

1. Broders AC: Carcinoma in situ contrasted benign penetrating epithelium. *JAMA* 1932;99:1670.
2. Silverstein M: Predicting local recurrences in patients with ductal

- carcinoma in situ. In Silverstein M (ed): "Ductal Carcinoma In Situ." Baltimore, MD: Williams & Wilkins, 1997:271-283.
3. Bedwani R, Vana J, Rosner D, et al.: Management and survival of female patients with "minimal" breast cancer. *Cancer* 1981;47:2769-2778.
4. Brown PW, Silverman J, Owens E, et al.: Intraductal "noninfiltrating" carcinoma of the breast. *Arch Surg* 1976;111:1063-1067.
5. Cartor D, Smith RL: Carcinoma in situ of the breast. *Cancer* 1977;1189-1193.
6. Lagios MD, Westdahl PR, Margolin FR, et al.: Ductal carcinoma in situ. *Cancer* 1982;50:1309-1314.
7. Millis RR, Thynne CS: In situ intraductal carcinoma of the breast—a long term follow-up study. *Brit J Surg* 1975;62:957-960.
8. Silverstein MJ, Barth A, Poller DN, et al.: Ten-year results comparing mastectomy to excision and radiation therapy for ductal carcinoma in situ of the breast. *Eur J Cancer* 1995;31:1425-1427.
9. Sunshine JA, Moseley HS, Fletcher WS, et al.: Breast carcinoma in situ—a retrospective review of 112 cases with a minimum 10 year follow-up. *Amer J Surg* 1985;150:44-51.
10. Von Reuden DG, Wilson RE: Intraductal carcinoma of the breast. *Surg Gyn Obs* 1984;158:105-111.
11. Westbrook KC, Gallager HS: Intraductal carcinoma of the breast—a comparative study. *Amer J Surg* 1975;130:667-670.
12. Schuh ME, Nemoto T, Penetrante RB, et al.: Intraductal carcinoma—analysis of presentations, pathologic findings, and outcomes of disease. *Arch Surg* 1986;121:1303-1307.
13. Kicken NF: Mastectomy. *Arch Surg* 1936;6-14.
14. Temple WJ, Lindsay RL, Magi E, et al.: Technical considerations for prophylactic mastectomy in patients at high risk for breast cancer. *Amer J Surg* 1991;161:413-415.
15. Leibman AJ, Kruse BD: Imaging of breast cancer after augmentation mammoplasty. *Ann Plas Surg* 1993;30:111-115.
16. Fajardo LL, Roberts CC, Huni KR: Mammographic surveillance of breast cancer patients: Should the mastectomy site be imaged? *Amer J Radiol* 1993;161:953-955.
17. Mund DF, Wolfson P, Gorczyca DP, et al.: Mammographically detected recurrent nonpalpable carcinoma developing in a transverse rectus abdominus myocutaneous flap. *Cancer* 1994;74:2804-2807.